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ABSTRACT

The findings of this study indicated that children's capacity to comprehend television advertising is primarily a developmental phenomenon, although social and experiential factors may have a moderate positive and a minor negative influence, respectively. Research subjects were 289 elementary school boys of first, third, and fifth grade levels, equally divided among the three groups. Canonical correlation analysis was utilized in a broad application of Piaget's theory to assess the relative contribution of developmental, social and experiential factors to children's comprehension of television advertising. Comprehension was operationally defined as cognitive understanding of the general structure and intent of commercials and demonstration of a selective attitudinal response toward them. (RB)

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MATURATIONAL AND SOCIAL FACTORS IN CHILDREN'S UNDERSTANDING OF TV COMMERCIALS*

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MATURATIONAL AND SOCIAL FACTORS IN CHILDREN'S UNDERSTANDING OF TV COMMERCIALS*

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SUMMARY

Canonical correlation analysis was utilized in a broad application of Piaget's theory to assess the relative contribution of developmental, social and experiential factors to children's comprehension of television advertising. Comprehension was operationally defined as cognitive understanding of the general structure and intent of commercials and demonstration of a selective attitudinal response toward them.

In the canonical procedure multiple measures were employed for cognition and attitude as the dependent variable sets, and for development, socialization and television exposure as the independent predictor variable sets. Altogether the three predictor sets accounted for 52% of the variance in cognitive understanding and 44% of the variance in attitudinal response. The developmental factor was found to be the best predictor of cognition and attitude ($p < .001$); the socialization factor was a significant though lower order predictor in both cases ($p < .05$); and the experiential factor was unrelated to cognitive acquisition but tended to produce a more favorable attitude toward commercials ($p < .05$). The approximate ratio of influence for development, socialization and television exposure was 8: 2: 1.

The findings thus indicated that children's capacity to comprehend television advertising is primarily a developmental phenomenon although social and experiential factors may have a moderate positive and a minor negative influence respectively.

A. INTRODUCTION

1. The Research Issue

In many developmental studies there is frequently an unanswered question concerning the extent to which non-developmental influences were responsible for the results obtained. There is a preponderant tendency in "Piagetian" research, for example, to employ only one independent variable, age (2). In recent writings Piaget himself has gone to considerable lengths to remind us that his is an interactionist theory which incorporates not only (a) biological maturation, for which age is a convenient index, but also (b) experience acquired through contact with the external physical environment and (c) the action of the social environment (6, 7).

Failure to examine predictor variables other than age is also a shortcoming of previous investigations of children's

understanding of television advertising (1, 8, 9). Apart from the theoretical implications which are thereby overlooked, this omission also leaves unanswered an important practical question facing many parents and of course government legislators: must parents wait until their children "naturally develop" cognitive resistance to the hundreds of persuasive messages encountered weekly on television, or can children be taught cognitive resistance through social instruction?

2. Research Design and Canonical Theory

Children's understanding of television advertising messages and their attitudes toward them are likely to be affected by multiple determinants, even within the broad classifications of biological, experiential and social factors. Canonical correlation provides a technique for summarizing and evaluating the contribution of classes of variables acting in concert. It is utilized in the present study to generate a more definitive picture of the underlying factors in children's reactions to commercials and to illustrate its general applicability in testing multi-component models such as those demanded by a comprehensive interpretation of Piaget's theory.

The particular advantage of canonical correlation analysis is that it allows examination of the relationship between sets of variables rather than between pairs of variables (e.g. as in "regular" correlation or as in multiple regression, which allows multiple predictor variable combinations but requires a single criterion variable). Bivariate examination of pairwise combinations of individual variables would require inspection of many potential relationships which in turn may not yield a satisfactory, uncomplicated explanation of overall relationships. Canonical correlation analysis is ideally designed to provide this type of explanation.

In applying the canonical model to sets of variables, the major requirement is that each set of variables can be given logical theoretical meaning as a set. Given this, a feature of canonical analysis is that independent contributions of various sets of predictor variables can be directly compared through an eigenvalue equivalent to the r^2 index of accounted-for variance. Further details of the technique are given in the canonical correlation computer program manual developed by Nie & Hull(5).

B. METHOD

1. Sample and Data

Data for this study were obtained from a broader project investigating advertising's impact on children supervised by the first (senior) author at the Wharton School. Research subjects were 289 primary school boys of first, third and fifth grade levels in approximately equal numbers. Family and school

backgrounds represented a range of upper-lower to upper socio-economic levels. Lengthy personal interviews were conducted individually with the children, and telephone interviews with their parents supplied relevant family characteristics. The children's response rate was 100% and 92% of associated households completed the parental interview.

For present purposes a final sample of 224 children was selected on the basis of complete child and parent data for all variables under current focus. Deliberate avoidance of partial or missing values for particular variables within individual cases was theoretically indicated by the use of canonical analysis since the objective was to make a precise comparison of alternative sets of variables. Simply put, this procedure prevented the situation of an individual contributing data to one or two variable sets but not to others. Inspection showed that case deletion was quite random across grades and schools.

Measures for variable sets 1 & 2 (see below) were obtained from content analysis of semistructured child interview protocols. The protocols were scored anonymously by three independent judges who obtained inter-coder reliability coefficients ranging from .79 to .97 (mean, .87) for the nine variables concerned. Measures for variable sets 3, 4 & 5 were closed-end responses to child and parental questionnaire items.[1]

2. Dependent and Independent Variable Sets

Five variable sets were defined in accord with development-related theoretical constructs. The first two sets encompassed measures of cognitive understanding of television advertising (TVCCOGN) and attitudinal response to television advertising (TVCATT) respectively.[2] These constituted the two criterion variable sets (although the likely dependence of attitude development on cognitive understanding was also examined). The three independent variable sets represented the three potential contributory factors of maturation (BIODEVT), socialization (SOCMOD), and relevant stimulus experience (TVEXP).

The intraset variable relationships were hypothesized as follows:

Set 1. TVCCOGN. The central construct underlying this variable set was the child's overall cognitive understanding of the structure and functions of television commercials. Six variables were adapted from previous Harvard research by Ward (1, 8) with conceptual stage modifications based on a theory of communicational message recognition developed by the second author (10). The variables provided measures of the child's ability to:

1a. discriminate television commercials from television programs
1b. comprehend the role of an external message source or sponsor

1c. perceive intended target audiences for commercial messages
1d. identify informative intent in commercials
1e. identify persuasive intent in commercials, and
1f. understand their symbolic representational nature

These were construed as a representative set of indicators of cognitive sophistication with regard to the TVC concept.

Set 2. TVCATT. Attitude in this study was conceptualized in the tricomponent sense (3, 4) to consist of an affective component, a belief component, and a behavior disposition component. The TVCATT variable set thus comprised separate measures of the child's attitudinal response to television commercials in terms of self-reported:

2a. liking
2b. belief
2c. motivation

In line with previous research in the field, attitudinal development was expected to reflect diminishing positive affect coupled with increasingly skeptical belief and more highly selective motivational tendencies--i.e. a less receptive and more negatively toned overall attitude toward television advertising.

Set 3. BIODEVT. The first set of predictor variables was designed to measure the mental maturation factor. It should be noted here that I.Q. scores, which may seem at first to be an appropriate index, would not be, on logical grounds. First of all, I.Q. remains relatively constant over time and thus could not index maturational increases within a given individual. Secondly, even though one could possibly use M.A. uncorrected for C.A., tradional intelligence tests are far removed from Piaget's conceptualization of mental maturity and therefore are not of theoretical significance here.

Instead, the BIODEVT set was composed of two variables:

3a. age
3b. grade level

Besides the usual index age, grade was added to the set on the supposition that it measures a major source of common intellectual input for the child. It might be contended that grade level reflects socialization forces through interaction with teachers and peers. However, the socialization at issue in this study is socialization with respect to television advertising. It is suggested that teachers perform little, if any, of this function and that there is no strong a priori reason, either, to expect like-aged peers to be powerful transmitters of more sophisticated views about television advertising.

Set 4. SOCMOD. The essential hypothesis relating variables in the "socialization models" set is the idea that older, more mature personal models are the important social contributors to the child's understanding of television advertising. For most children the most available of such models will be parents and, if present in the family, older siblings. The three variables comprising the SOCMOD set were:

4a. degree of parent-child interaction
4b. level of parental education
4c. presence of older sibs

The process involved with this variable set concerns the opportunity for socialization to occur through interaction with more sophisticated members of the child's immediate social environment, hence the first two variables. In the case of the third variable, sibling order, it was hypothesized that younger children would be in an advantageous position to learn about television advertising from older and presumably more sophisticated sibs.

Set 5. TVEXP. The third independent variable set was addressed to the child's degree of experiential interaction with the particular stimulus object or event, in this case television commercials. Two variables defined the TVEXP set:

5a. television exposure
5b. number of television sets in household

The first variable is an obvious choice; but a basic fact which has often been overlooked in connection with degree of exposure to television (and, by implication, exposure to television advertising) is that exposure automatically accumulates with age. Thus it would be unusual for an older child to be less experienced with the medium than a child one or two years his junior and quite improbable as the age difference expands from first to fifth grade. Cumulative exposure, therefore, should be positively related to cognitive understanding of commercials and at the same time productive of an increasingly negative attitude toward them.

However, the actual index of exposure employed in this and most previous research is a non-cumulative measure in that it reflects each respondent's present level of viewing. There is no reason why a child's present viewing habits should be related to his understanding of commercials, since the important consideration, surely, is accumulated exposure, i.e. total time spent with the medium. On the other hand, present exposure level may well be related to attitude, in that reduced viewing time would be an indication of negative attitudes toward television in general, and, it seems safe to infer, television advertising in particular. In sum, present level of television exposure was hypothesized to relate (through TVEXP) to TVCATT but not to TVCCOGN.

The second variable comprising the TVEXP set was the number of television receivers in the household. The probable opportunity for children to view with less restriction when separate receivers are available led to the inclusion of this variable in the viewing experience set. In line with the exposure argument above, number of television sets was hypothesized to be negatively related to TVCATT--or alternatively, positively related to favorable attitude--while, under the sufficient cumulative exposure assumption, bearing little relationship to TVCCOGN.

3. Inter-set Canonical Relationships

Extrapolating from the specific theorizing above, the following relationships were hypothesized for the five canonical variable sets:

First, designating TVCCOGN as the criterion set, significant independent contributions were expected from BIODEVT and SOCMOD, with TVEXP unrelated.

Second, designating TVCATT as the criterion set, significant contributions were expected from all three independent sets BIODEVT, SOCMOD and TVEXP with the first two entering an inverse function (i.e., associated with negative attitude) and the last a direct one.

Finally, again designating TVCATT as the criterion set but now casting TVCCOGN in an independent contributory role, a significant inverse relationship was predicted.

C. RESULTS

As directionality is not represented in canonical correlation coefficients, which range from 0 to 1, directional support for the research hypotheses must be inferred from the original bivariate correlation matrix (Table 1).

It may be noted that the correlations between the cognition and attitude component variables are predominantly negative, as hypothesized, and that the developmental indices of age and grade are also in line with expectations, correlating positively with most of the cognition variables and negatively with the attitudinal variables. However the social and experiential variables reveal an overall pattern of low and somewhat random looking correlations. This is precisely where canonical analysis is most useful. By summarizing the factor contributions underlying sets of individual correlations it can bring to light clearer contributions to accountable variance in the overall data.

1. Contributions to Cognitive Understanding of Commercials

Canonical correlations between TVCCOGN and BIODEVT, SOCMOD and TVEXP are shown in the first part of Table 2 along with

canonical factor eigenvalue equivalents of jointly accounted-for variance (r^2) and associated significance levels.[3] In all cases, the first canonical variate accounted for any significant linear relationship observed between variable set pairs, so minor orthogonal variates are not shown. The maturational factor represented the largest contribution to TVCCOGN, with shared variance of approximately 40% Socialization accounted for about 9%, a smaller but statistically significant contribution. Experiential interaction contributed only 4% and did not reach statistical significance.

Inspection of the original correlation matrix and of canonical coefficients indicating the contribution of individual variables to respective significant canonical variates revealed that age and grade level, as expected, had positive standardized regression weights of .25 and .75 in the BIODEVT variate, which in turn was positively correlated with TVCCOGN. The greater relative weighting of grade level may have reflected the linear but discontinuous selection of first, third and fifth grades rather than subservience as a variable to age.

Within the second significant variable set, SOCMOD, the highest canonical variate contribution was made by parental education level (.81), followed by presence of older sibs (-.50) and parent-child interaction (.34). The negative coefficent for sibling position was contrary to prediction and suggests a first-born effect. A possible post facto explanation is that parental monitoring of the first child's television viewing is greater than with subsequent children, tending to accelerate the eldest child's sophistication about commercials. In any case, older sibs apparently do not provide influential models for children's understanding of television advertising. Better educated parents seem to be the main social accelerator of cognitive understanding.

2. Contributions to Attitude Toward Commercials

Canonical correlations between TVCATT and BIODEVT, SOCMOD and TVEXP are shown in the second part of Table 2. The relationships were perfectly in accord with predictions. Maturation contributed approximately 31%, socialization 7% and present experiential level 6% to shared variance with attitudinal response. Despite its small contribution, television exposure was shown to have a significant effect on children's attitudes toward commercials. While maturation and socialization engender a more negative or "defensive" attitude toward commercials, heavy television exposure has the opposite tendency.

Canonical coefficients for individual variables within the BIODEVT and SOCMOD sets were similar to those observed previously. For the TVEXP canonical variate, present viewing level contributed a greater regression weight (.94) than did number of sets (.27), which fits intuitive expectation.

Table 2

CANONICAL RELATIONSHIPS BETWEEN INDEPENDENT AND CRITERION VARIABLE SETS

Independent Variable Set	Canonical Correlation[a]	Eigenvalue (r^2 %)	Significance Level
Criterion Set: TVCCOGN			
BIODEVT	.63	39.57	.001
SOCMOD	.29	8.73	.05
TVEXP	(-).20	3.94	n.s.
Criterion Set: TVCATT			
BIODEVT	(-).55	30.78	.001
SOCMOD	(-).27	7.33	.02
TVEXP	.24	5.74	.02
Criterion Set: TVCATT			
TVCCOGN	(-).65	41.92	.001

[a] Canonical correlation coefficients range from 0 to 1.00 since within-set variables are grouped regardless of sign; directionality is assessed from the input matrix.

3. Cognition and Attitude

The relationship between TVCCOGN and TVCATT is shown in the final section of Table 2. The child's level of cognitive understanding of television advertising is clearly associated with his attitudinal response to it. As indicated by the bivariate correlation directionality, children's attitudinal positivity toward commercials declines with increasing cognitive awareness of their structure and purpose.

While it may not be overly surprising that attitudinal response should be substantially predictable from cognitive understanding of the attitude object, perhaps the most revealing finding is that the three factor "Piagetian model" is an equally good predictor. Noting that its component measures such as age, parental education level, and television exposure are conceptually far removed from the dependent measures, the Piagetian model accounted for 44% of the variance associated with TVCATT (vs. 42% for cognitive understanding treated as a predictor) and 52% of the variance associated with TVCCOGN.

D. CONCLUSIONS

The present study confirms earlier suppositions that the child's ontogenetic developmental level, as indexed by age and grade, is the central determinant of his cognitive understanding of television advertising and correspondent attitudinal response. However it was additionally demonstrated that socialization, in the form of opportunity to interact with older, more sophisticated members of the immediate social environment, represents a significant if secondary contributing factor.

The practical implications of these findings are that children will, in time, develop appropriate understanding of television commercials and manifest a more selective attitude toward them. The fact that the developmental component in this process is about four times as large as the social component suggests that, although parents cannot "force" early sophistication in children's reactions to television advertising, their attention and instruction can enhance the process and is certainly worthwhile. Parents may also heed slight evidence that too much television may increase children's attitudinal susceptibility to commercials.

Finally, the usefulness of canonical analysis was illustrated by its capacity to relate logically and theoretically derived sets of variables in situations where individual variable comparisons can be numerous and difficult to interpret. Complex relationships inherent in models such as the one favored here, based on Piagetian biosocial constructs, are reducible through canonical factoring to comprehensible vehicles with high explanatory power.

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FOOTNOTES

[1] Full measurement particulars are described in (10).

[2] Computer label shorthand is introduced for the sake of efficient exposition and is used predominantly hereafter. TVC refers to television commercials considered as a generalized class concept, the primary "attitude object" for the study. Other mnemonic labels should be easily decipherable.

[3] A split-sample analysis was performed as a cross-validation check on the canonical correlation coefficients reported in Table 2. Contributions to variance were similar in both subsamples and confirmed the stability of the total sample analysis.